SIEMENS

2-port and 3-port zone valves & actuators, PN16

MVI422...MXI422...

2-port valve & actuator MVI422…

3-port valve & actuator MXI422...

With on/off characteristics

- Stainless steel valve body
- DN 15, DN 20 and DN 25
- K_{vs} 2.0-3.5 m^3/h
- Internally threaded connections Rp to ISO 7-1
- Fail safe (Spring return) operation
- AC 230 V operating voltage, 2-position control signal

CE

Use

- For use in ventilating and air-conditioning systems for water-side terminal units in closed circuits, e.g. induction units, fan-coil units, small reheaters and small re-coolers.
  - 2-pipe systems with 1 heat exchanger for heating and cooling
  - 4-pipe systems with 2 separate heat exchangers for heating and cooling
- In closed-circuit heating systems, e.g.:
  - Separate floors in a building
  - Apartments
  - Individual rooms
  - Floor heating

Functions

The zone valves are closed when de-energized. An On/Off controller (thermostat) is required to drive the motorized valve actuators. If the medium temperature deviates from the setpoint, the controller sends a control signal to the actuator to open the valve. When the medium temperature returns to the setpoint, the control signal is cut off and the valve closes.

2-position SPST control signal

The actuator requires an On/Off controller, typically a room thermostat.

Type summary

Type	Stock number	DN	Connections	PN class	K_{vs} ⋈ A→AB [m³/h]	ΔP_{max} [kPa]	ΔP_s [kPa]
MVI422.15	S55310-M107	15	Internally threaded Rp	16	2.5	350[1]	350[2]
MVI422.20	S55310-M108	20			3.0	350[1]	350[2]
MVI422.25	S55310-M109	25			3.5	350[1]	350[2]

Type	Stock number	DN	Connections	PN class	K_{vs} AB↔A [m³/h]	K_{vs} AB↔B [m³/h]	ΔP_{max} [kPa]	ΔP_s [kPa]
MXI422.15	S55310-M110	15	Internally threaded Rp	16	2.5	2.5	250[1]	250[2]
MXI422.20	S55310-M111	20			3.0	3.0	200[1]	200[2]
MXI422.25	S55310-M112	25			3.5	3.5	150[1]	150[2]

[1] 3-port valve used as a diverting valve (AB→A, AB→B).

[2] 3-port valve used as a mixing valve (A→AB, B→AB).

K_{vs} Nominal flow rate for cold water (5…30 °C) through the fully open valve (H_{100}), at differential pressure 100 kPa (1 bar).

ΔP_{max} Max. permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve (max. recommended operating differential pressure).

ΔP_s Max. permissible differential pressure at which the motorized valve closes securely against pressure (close off pressure).

Ordering

When ordering, indicate the quantity, product name and number.

Example

Product number	Stock number	Product name	Quantity
MVI422.15	S55310-M107	2-port zone valve, PN16 DN15, K_{vs} 2.5	1000
ASK39.3	S55845-Z251	Protection shield	1000

Rev. no.

See Revision number overview on page 11.

Equipment combinations

Room thermostats

Type	Room thermostat compatible to MVI422../MXI422..
RAB...	RAB11; RAB11.1; RAB21; RAB31; RAB31.1
RAA...	RAA11; RAA21; RAA31…; RAA41
RCC...	RCC10; RCC20; RCC30
RCU...	RCU10
RDF...	RDF110...; RDF310.2/MM; RDF300.02; RDF302; RDF510; RDF530; RDF600...; RDF800...
RDG...	RDG100...; RDG110; RDG160…
RDD...	RDD100; RDD100.1; RDD100.1RFS; RDD310/MM; RDD310/EH; RDD510…; RDD810…
RDE...	RDE100; RDE100.1; RDE100.1RFS; RDE410/EH
RDH…	RDH100; RDH100RF/SET
RDJ…	RDJ100; RDJ100RF/SET
REV…	REV13...; REV24…, REV24RF/SET
RDS…	RDS110; RDS110.R

Technical design

Valve

The valve and actuator are supplied in one easy-to-install unit. The valve has a stainless steel (304) body with Rp… female threaded connections. A special rubber flap operates as closing element to ensure tight shut-off. The spindle is sealed with O-rings.

Actuator

The valve is connected by an integral 20 cm single insulation cable.

The actuator opens the valve electrically and closes it by spring force. It incorporates a synchronous motor, a gear mechanism and a return spring. The motor is overload-resistant and anti-locking, making continuous operation possible. When the valve opens, travel is limited by a mechanical stop. The gear mechanism incorporates an overrun for the closing valve. This protects the gears from mechanical shock and increases service life.

Manual operation

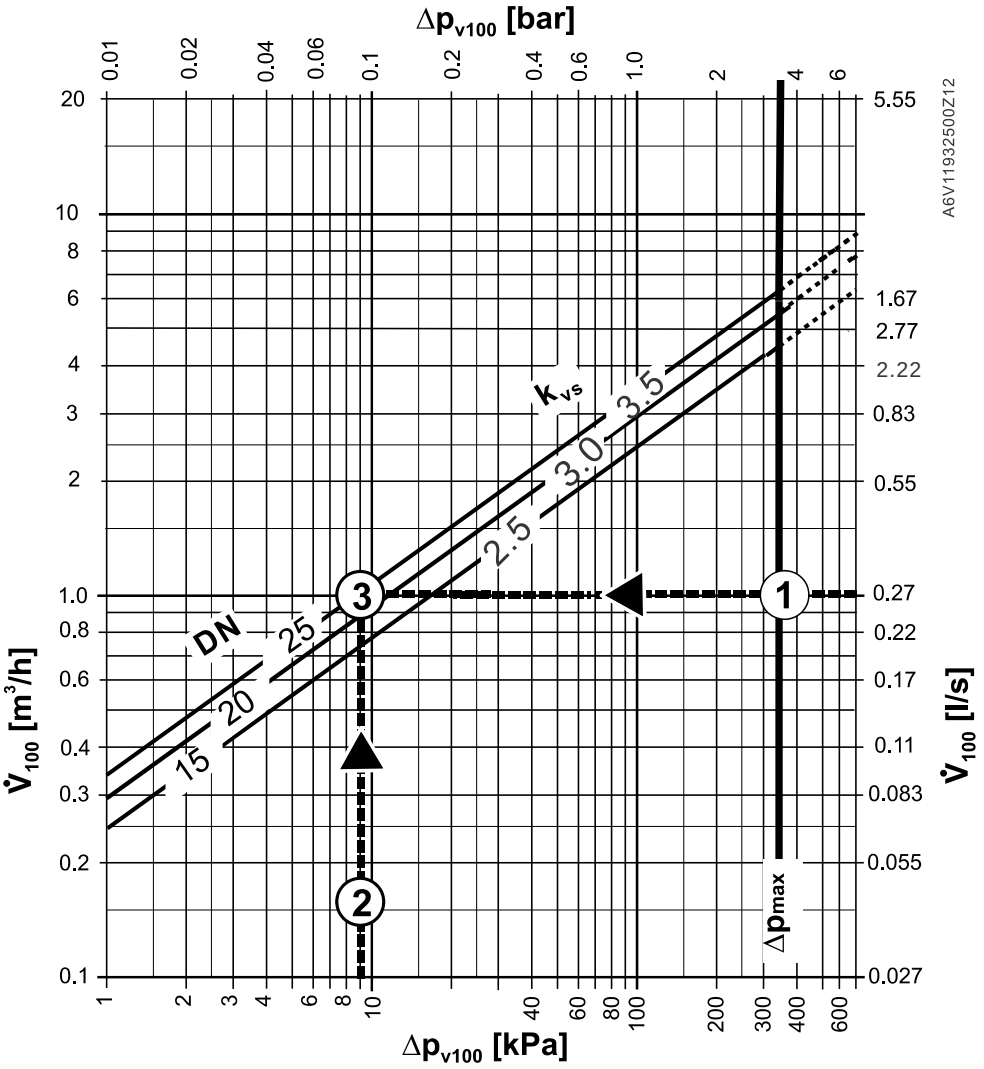
The valve can be opened to approximately 50 % with a lockable lever. When normal operation is resumed, the lever is automatically disengaged.

Example:

① $\dot{V}_{100}$ = 0.27 l/s

② ΔP_{v100} = 9 kPa

③ k_{vs} value required = 3.5 m³/h



ΔP_{v100} = Differential pressure across the fully open valve and the valve's control path A → AB (2-port valves), AB → A (3-port diverting valves) by a volume flow $\dot{V}_{100}$

$\dot{V}_{100}$ = Volume flow through the fully open valve (H_{100})

ΔP_{max} = Max. permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve

100 kPa = 1 bar ≈ 10 mWC

1 m³/h = 0.278 l/s water at 20 °C

Engineering

Refer to the Mounting notes and Commissioning notes.

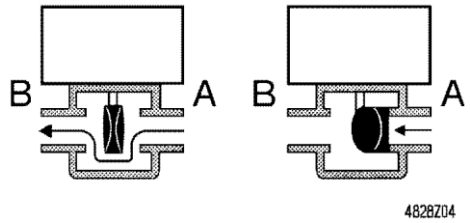
Note the correct direction of flow, for both two-port and three-port valves as shown in the diagrams below.

Recommendation

Fit a strainer upstream of the valve to increase reliability.

Warning

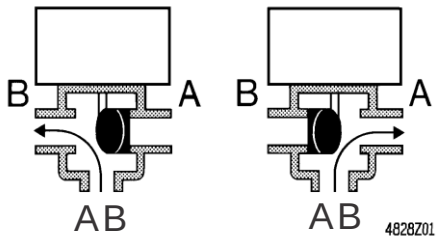
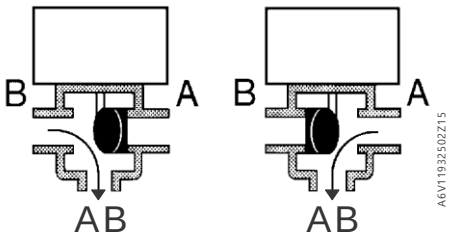
The direction of flow for two-port valves MUST be as indicated by the arrow, from A → B.

MVI422…two-port valve

De-energized position: Port “A” closed

Three-port valves can be used in both diverting and mixing circuits.

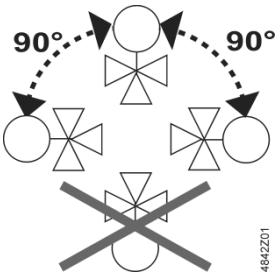
When used in diverting circuits, the direction of flow for three-port valves is as indicated by the arrow in the valve body, from AB → B and AB → A. (recommended).

When used in mixing circuits, the direction of flow for three-port valves is opposite the arrow in valve body, from A → AB and B → AB.

MXI422…three-port valve (diverting circuits)	MXI422…three-port valve (mixing circuits)
	
De-energized position: Port “A” closed	De-energized position: Port “A” closed

Mounting

Orientation



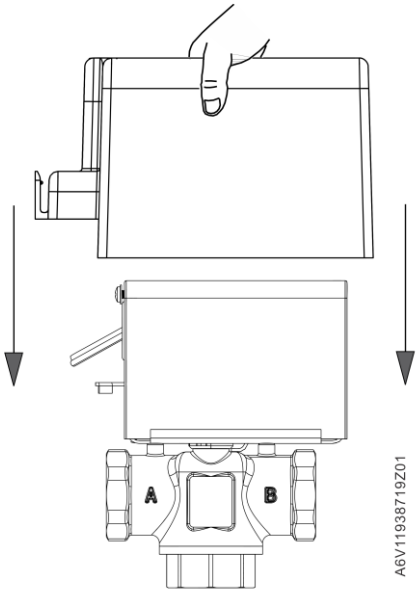
Comply with the specified direction of flow in all cases (refer to Engineering). Mounting instructions A6V11932502 are enclosed with the packaging.

Electrical connection

- Connect electricity as shown in the plant diagram.
- Observe all regulations for eletrical installation.
- Connect the connecting cable to a conduit box.

ASK39.3 protection shield

Use protection shield (ASK39.3) to avoid splash water on the actuator. Mounting instructions A6V11938719 are enclosed with the ASK39.3 packaging.

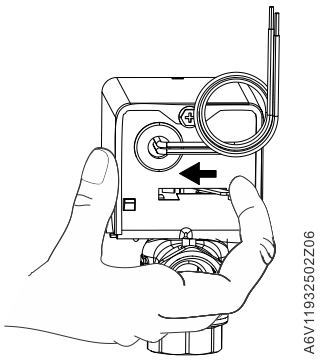
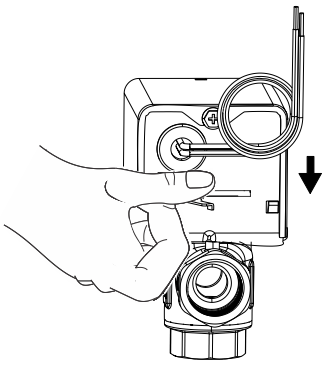
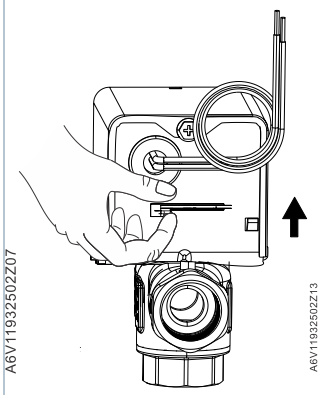


MVI422../MXI422..

Commissioning

Manual adjustment

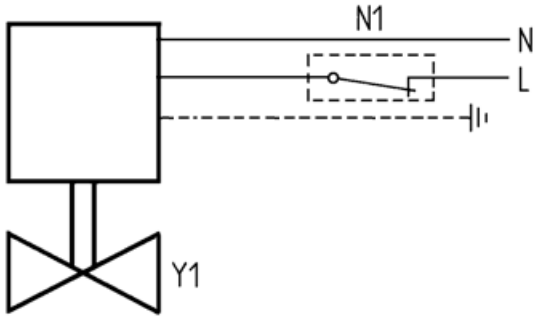
The valve can be opened to approximately 50 % with a lever and locked into position. The lever automatically disengages when normal operation resumes.

Open valve manually		Release lever manually
		
Slide lever	The lever is locked into position at a valve opening of approx. 50%	Release lever from the lock position

Connection diagram

Caution

Valves MVI422… and MXI422…



N	Neutral
L	Phase
N1	Temperature controller (thermostat)
⊥	Earthing conductor
Y1	Valve

Notes

Security

⚠ CAUTION

National safety regulations

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe all national provisions and comply with the appropriate safety regulations.

Maintenance

MVI422...MXI422... valves require no maintenance.

⚠ CAUTION

When servicing the valve/actuator:

- Deactivate the pump and turn off power.
- Close the shutoff valves.
- Fully reduce the pressure in the piping system and allow pipes to completely cool down.

If necessary, disconnect the electrical wires.

Stem sealing gland

The stem sealing gland cannot be exchanged. The entire valve must be replaced in the event of leakage. Contact your local office or branch.

Disposal

⚠ WARNING

Tensioned return spring

Opening the valve housing can release the highly tensioned return spring, resulting in flying parts and injury.

- Do not open the valve housing.

Do not dispose of the valve as domestic garbage.

- Special handling of individual components may be required by law or make ecological sense.
- Comply with all local and currently applicable laws and regulations.

Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Technical data

Electrical interface	
Supply voltage • Tolerance • Frequency	AC 230 V –15 / +10 % 50 Hz/60 Hz
Power consumption	6.5 VA
Duty cycle	100%
Fuse	External
Control signal	On/Off with controller thermostat (phase-cut or pulse-width-modulated signals are **not** allowed)
Max. number of switching cycles	Approx. 10, 000 per year (equivalent to approx. 50 per day)
Connecting cable	Wire length 20 cm, 2-core

Operating data		
Operating pressure	PN16	
Leakage • Straight-through port and bypass	Tight shut off (100 % airtight)	
Allowed media	• Water, recommended quality as per VDI2035 • Water/glycol mixture (max. 50 % vol.)	
Water temperature	1...95 °C	
Manual operation	0…50 %	
Position when de-energized	A → B closed	
Positioning time	Opening Closing	15 s (motor-driven) 10 s (spring force)
Δp_s , max. Δp_{v100} , k_{vs}	For values, see table under “ Type summary ”	
Maintenance	None	

Materials		
Valve body, seat	Stainless steel (304)	
Valve flap and O-rings	NBR (nitrobutile rubber)	
Spindle	Stainless steel (304)	
Actuator	Base plate Housing	Stainless steel Aluminum

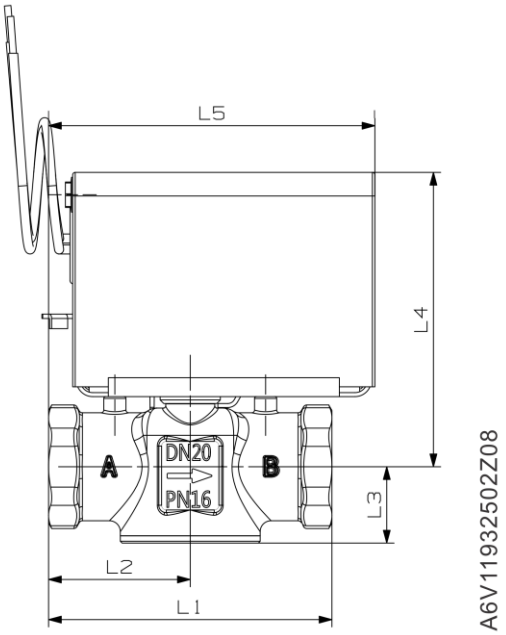
General ambient conditions	
Operation	As per EN60721-3-3 Class 3K3
• Temperature • Humidity	+1... +50 °C 5...85 % r.h. (non-condensing)
Transportation	As per EN60721-3-2 Class 2K3
• Temperature • Humidity	–25... +70 °C < 95 % r.h. (non-condensing)
Storage	As per EN60721-3-1 Class 1K3
• Temperature • Humidity	–5... 45 °C 5...95 % r.h. (non-condensing)

Standards	
Product safety • Overvoltage category	 EN60730 Section 2.7: Protection class I (with earthing)
Protection standard	IP 40 as per DIN40050
Electromagnetic compability (Applications)	For use in residential, commercial, light-industrial and industrial environments
EU conformity (CE)	A5W00116547
Evironmental compability	The product environmental declaration (A5W00100558) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions

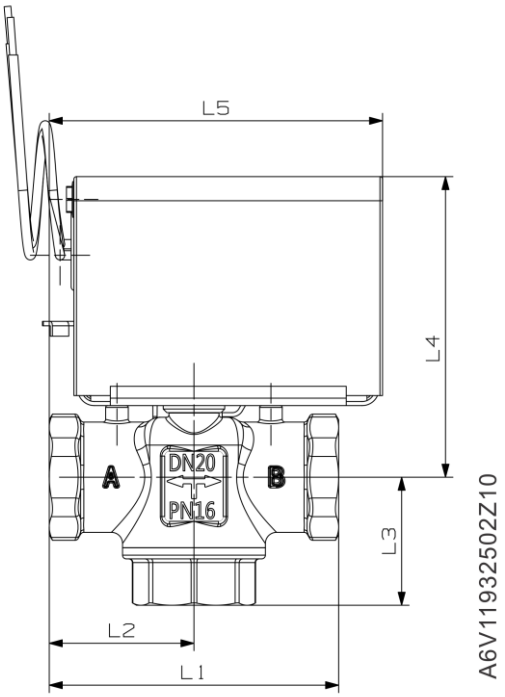
2-port valves

MVI422…

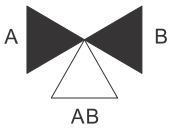


3-port valves

MXI422…



Valve type	DN	Rp	L1	L2	L3	L4	L5	kg
		[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
MV422.15	15	Rp ½	70	35	21	80	86	0.657
MVI422.20	20	Rp ¾	78	39	21	80	90	0.675
MVI422.25	25	Rp 1	88	44	25	84	95	0.806



Valve type	DN	Rp	L1	L2	L3	L4	L5	kg
		[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
MXI422.15	15	Rp ½	70	35	35	80	86	0.685
MXI422.20	20	Rp ¾	78	39	35	80	90	0.711
MXI422.25	25	Rp 1	88	44	43	84	95	0.881

Revision number overview

Type	Valid from rev. no.	Type	Valid from rev. no
MVI422.15	..A	MXI422.15	..A
MVI422.20	..A	MXI422.20	..A
MVI422.25	..A	MXI422.25	..A

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